

**November 2004 Water Sampling**

**Validation Data Package  
for  
Configuration 1 Interim Action  
Well Field Monthly Sampling  
Moab, Utah**

March 2005

# Moab, Utah

November 18 and 19, 2004

## Data Package Contents

This data package includes the following information:

<u>Item No.</u>	<u>Description of Contents</u>
1.	<b>Sampling Event Summary</b>
2.	<b>Sample Location Map</b>
3.	<b>Data Assessment Summary</b>
	Field Activities Verification Checklist
	Laboratory Performance Assessment
	Field Analysis/Activities
	Certification

### Attachment 1— Data Presentation

Minimums and Maximums Report  
Anomalous Data Review Checksheet  
Water Quality Data  
Water Level Data  
Time Versus Concentration Graphs

### Attachment 2—Trip Report

## **Sampling Event Summary**

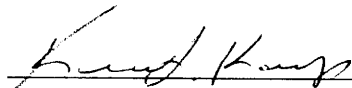
**Site:** Moab, Utah

**Sampling Period:** November 18 and 19, 2004

The purpose of this sampling was to collect data that can be used to evaluate the performance of Configuration 1 of the interim action well field. This is the seventh monthly performance sampling round conducted in 2004 for Configuration 1.

Sampling and analysis was conducted in accordance with the *Operations, Maintenance, and Performance Monitoring Plan for the Interim Action Ground Water Treatment System, February 2004*. Ground water samples were collected from 10 extraction wells (0470-0479), 7 observation wells (0403, 0407, 0483, 0484, 0557, 0559, and 0560), 3 piezometers (0563, 0564, and 0565), and 4 surface water locations (0216, 0236, 0547, and 0548), which are the Colorado River sample locations, evaporation pond inlet, and the evaporation pond re-circulation pump discharge, respectively. Including one duplicate and one equipment blank, a total of 26 samples were collected.

Time versus concentration graphs for selected wells and analytes are included.

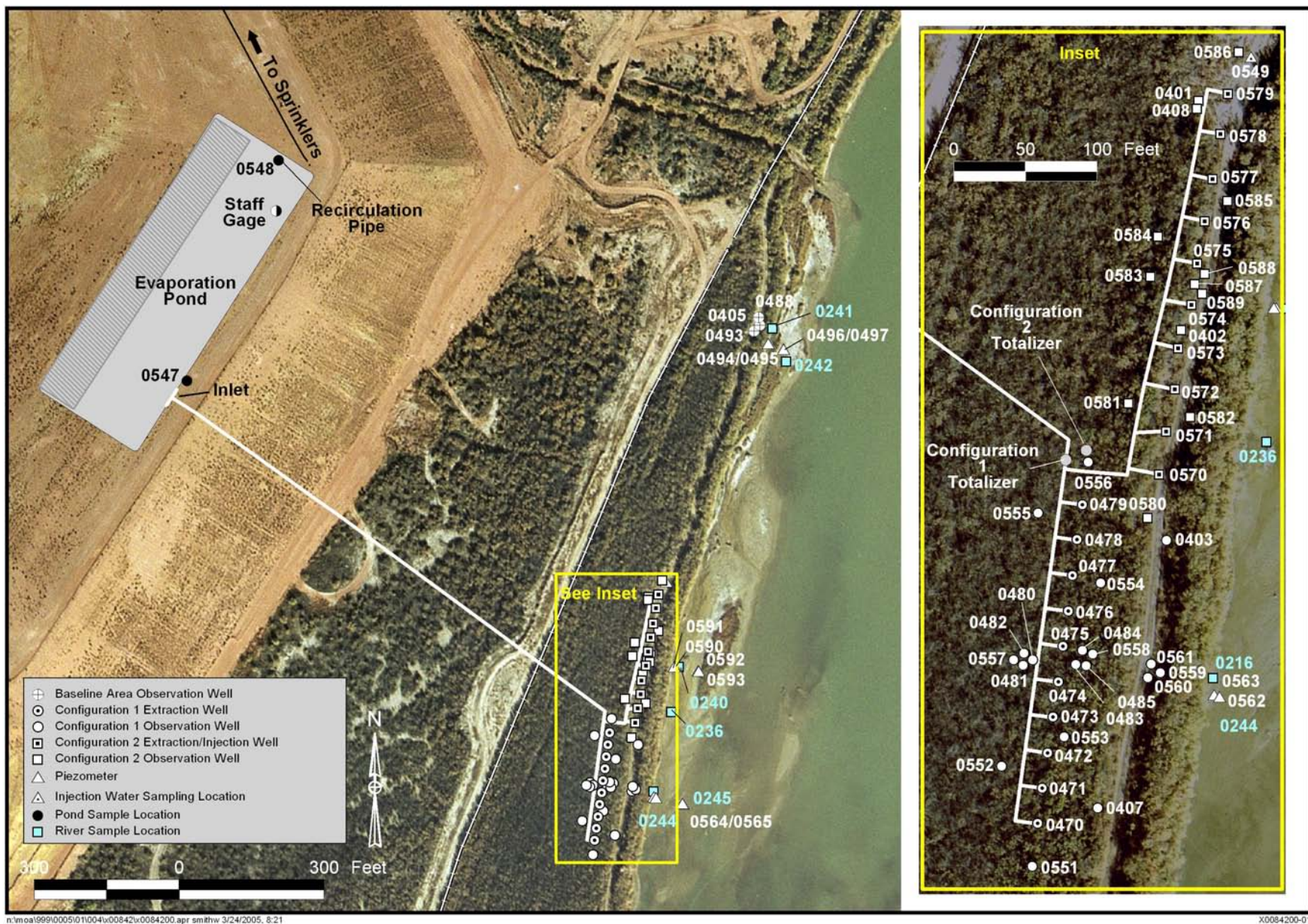


Kenneth E. Karp  
Site Lead

3-24-05

Date

## **Sample Location Map**



Sample Locations at the Interim Action Well Field and Baseline Area (may include locations not sampled)

## **Data Assessment Summary**

## Water Sampling Field Activities Verification Checklist

<b>Project</b>	<u>Moab, Utah</u>	<b>Date(s) of Water Sampling</b>	<u>November 18 and 19, 2004</u>
<b>Date(s) of Verification</b>	<u>February 22, 2005</u>	<b>Name of Verifier</b>	<u>Jeff Price</u>

	<b>Response (Yes, No, NA)</b>	<b>Comments</b>
1. Is the SAP the primary document directing field procedures?	<u>Yes</u>	
List other documents, SOP's, instructions.	<u>NA</u>	
2. Were the sampling locations specified in the planning documents sampled?	<u>No</u>	<u>Piezometer 0562 was dry.</u>
3. Was a pre-trip calibration conducted as specified in the above named documents?	<u>Yes</u>	
4. Was an operational check of the field equipment conducted twice daily?	<u>Yes</u>	
Did the operational checks meet criteria?	<u>Yes</u>	
5. Were the number and types (alkalinity, temperature, Ec, pH, turbidity, DO, ORP) of field measurements taken as specified?	<u>Yes</u>	
6. Was the Category of the well documented?	<u>Yes</u>	
7. Were the following conditions met when purging a Category I well:		
Was one pump/tubing volume purged prior to sampling?	<u>Yes</u>	
Did the water level stabilize prior to sampling?	<u>Yes</u>	
Did pH, specific conductance, and turbidity measurements stabilize prior to sampling?	<u>Yes</u>	
Was the flow rate less than 500 mL/min?	<u>Yes</u>	
If a portable pump was used, was there a 4 hour delay between pump installation and sampling?	<u>NA</u>	



## Water Sampling Field Activities Verification Checklist (continued)

	Response (Yes, No, NA)	Comments
8. Were the following conditions met when purging a Category II well:		
Was the flow rate less than 500 mL/min?	Yes	
Was one pump/tubing volume removed prior to sampling?	Yes	
9. Were duplicates taken at a frequency of one per 20 samples?	No	Project Management decision to collect one.
10. Were equipment blanks taken at a frequency of one per 20 samples that were collected with nondedicated equipment?	Yes	
11. Were trip blanks prepared and included with each shipment of VOC samples?	NA	
12. Were QC samples assigned a fictitious site identification number?	Yes	
Was the true identity of the samples recorded on the Quality Assurance Sample Log?	Yes	
13. Were samples collected in the containers specified?	Yes	
14. Were samples filtered and preserved as specified?	Yes	
15. Were the number and types of samples collected as specified?	Yes	
16. Were chain of custody records completed and was sample custody maintained?	Yes	
17. Are field data sheets signed and dated by both team members?	Yes	
18. Was all other pertinent information documented on the field data sheets?	Yes	
19. Was the presence or absence of ice in the cooler documented at every sample location?	Yes	
20. Were water levels measured at the locations specified in the planning documents?	Yes	

## Laboratory Performance Assessment

### General Information

Requisition No.: 04110136  
Sample Event: November 18 and 19, 2004  
Site(s): Moab, Utah  
Laboratory: Paragon Analytics  
Work Order No.: 0411218  
Analysis: Metals, Inorganics  
Validator: S. Donovan/J. Price  
Review Date: December 20, 2004

This validation was performed according to the *Environmental Procedures Catalog* (STO 6), "Standard Practice for Validation of Laboratory Data", GT-9(P) (2004). All analyses were successfully completed. The samples were prepared and analyzed using accepted procedures based on methods specified by line item code, which are listed in Table 1.

Table 1. Analytes and Methods

Analyte	Line Item Code	Prep Method	Analytical Method
Uranium, U	GJO-01	SW-846 3005A	SW-846 6020
Chloride, Cl	MIS-A-039	SW-846 9056	SW-846 9056
Sulfate, SO <sub>4</sub>	MIS-A-044	SW-846 9056	SW-846 9056
Ammonia as N, NH <sub>3</sub> -N	WCH-A-005	MCAWW 350.1	MCAWW 350.1
Total Dissolved Solids, TDS	WCH-A-033	MCAWW 160.1	MCAWW 160.1

### Data Qualifier Summary

One uranium result was qualified as "U" as listed in Table 2.

Table 2. Qualified Results

Sample Number	Location	Analyte	Flag	Reason
0411218-23	2690	Uranium	U	Less than 5 times the blank

### Sample Shipping/Receiving

Paragon Analytics in Fort Collins, Colorado, received 26 samples on November 20, 2004 accompanied by a Chain of Custody (COC) form. The COC form was checked to confirm that all of the samples were listed on the form and that signatures and dates were present indicating sample relinquishment and receipt.

The sample submittal documents including the COC form, the Sample Submittal Form, and the sample tickets had no errors or omissions.

### Preservation and Holding Times

The sample shipment was received cool and intact with temperature within the cooler of 2.6 °C, which is in compliance with requirements. All samples had been preserved correctly for the requested analyses and all samples were analyzed within the applicable holding times.

### Laboratory Instrument Calibration

All laboratory instrument calibrations were performed correctly in accordance with the cited methods.

#### *Method SW-846 6020*

Calibration for uranium was performed on November 14, 2004. The initial calibration was performed using 4 calibration standards resulting in a correlation coefficient ( $r^2$ ) value greater than 0.995. The absolute value of the intercept was less than 3 times the method detection limit (MDL). Calibration and laboratory spike standards were prepared from independent sources. Initial and continuing calibration verification (CCV) checks were made at the required frequency resulting in 12 CCVs. All calibration checks met the acceptance criteria. Reporting limit verification checks were made at the required frequency to verify the linearity of the calibration curve near the practical quantitation limit. The check results were within the acceptance criteria. The mass calibration and resolution was checked at the beginning of each analytical run in accordance with the procedure. Internal standard recoveries were stable and within acceptance ranges.

#### *Method SW-846 9056*

Initial calibrations were performed for chloride and sulfate using 5 calibration standards each on November 11, 2004. Each calibration curve  $r^2$  value was greater than 0.995 with an intercept less than 3 times the MDL. Initial calibration and calibration check standards were prepared from independent sources. CCVs were made at the correct frequency resulting in 7 CCVs that were within the acceptance criteria.

#### *Method MCAWW 350.1*

The initial calibration for ammonia as N was performed using 6 calibration standards on November 13, 2004 resulting in a  $r^2$  value greater than 0.995. Initial and CCVs were made at the required frequency resulting in 7 CCVs that were within the acceptance criteria.

#### *Method MCAWW 160.1*

There is no initial or continuing calibration requirement associated with the determination of total dissolved solids (TDS).

### Method and Calibration Blanks

The uranium initial and continuing calibration blanks were below the practical quantitation limit. The chloride, sulfate, NH<sub>3</sub>-N, and TDS method blanks, and initial and continuing calibration blanks were below the MDLs.

### Inductively Coupled Plasma Interference Check Sample Analysis

Inductively coupled plasma interference check samples were analyzed at the required frequency and all results met the acceptance criteria.

### Matrix Spike Analysis

Matrix spike and matrix spike duplicate pairs were analyzed for uranium, NH<sub>3</sub>-N, chloride, and sulfate with acceptable results.

### Laboratory Replicate Analysis

The relative percent difference values for the matrix spike duplicate and laboratory duplicate sample results for all analytes were less than 20 percent.

### Laboratory Control Sample

Laboratory control samples were analyzed at the correct frequency with acceptable results for all analysis categories.

### Metals Serial Dilution

Two serial dilutions were prepared and analyzed to monitor chemical or physical interferences in the sample matrix. One met and one failed to meet the acceptance criteria. A matrix interference was not indicated by the matrix spike and matrix spike duplicate data. The serial dilution failure can be attributed to the high dilution factors that were needed for these samples.

### Detection Limits/Dilutions

Samples were diluted in a consistent and acceptable manner when required. The samples were diluted prior to analysis of uranium to reduce interferences. The required detection limits were achieved for all analytes.

### Completeness

Results were reported in the correct units for all analytes requested using contract-required laboratory qualifiers.

### Chromatography Peak Integration

The integration of analyte peaks was reviewed for all chloride and sulfate data. There were no manual integrations performed and all peak integrations were satisfactory.

### Electronic Data Deliverable File

An Electronic Data Deliverable (EDD) file arrived on December 17, 2004; the EDD validation application identified no problems with the EDD file.

## **Field Analyses/Activities**

The following information summarizes the field analyses and activities for this sampling event period.

### **Field Activities**

All monitor well results were qualified with an “F” flag in the database indicating the wells were purged and sampled using the low-flow sampling method. Extraction wells are not sampled using the low-flow sampling method.

An equipment blank was collected and analyzed for the same constituents as the Moab environmental samples. Concentrations measured in the equipment blank were below their respective contract required detection limit; therefore, equipment blank results are considered acceptable. A duplicate sample was collected from well 0236. There are no established regulatory criteria for the evaluation of field duplicate samples; therefore, U.S. Environmental Protection Agency (EPA) guidance for laboratory duplicates (which is conservative for field duplicates) was used to assess the precision of the field duplicates. With the exception of the uranium duplicate result, which varied by 32 relative percent difference, all other duplicate results met the laboratory duplicate criteria of +/- 20 relative percent difference and are considered acceptable.

## Certification

Results were reported in correct units for all analytes requested. Appropriate contract-required laboratory qualifiers and target analyte lists were used. The required detection limits were met when possible or an explanation of why they were not met was given in the laboratory case narrative. All analytical quality control criteria were met except as qualified on the Ground Water Quality Data by Parameter, Surface Water Quality by Parameter, or equipment/trip blank database printouts. The meaning of data qualifiers is defined on the database printouts or defined in the EPA Contract Laboratory Program Statement of Work for Inorganic Analysis, Multi-Media Multi-Concentration, Document Number ILMO2.0, 1991. All data in this package are considered validated and may be treated as final results.

Laboratory Validation Lead:

Steve Donovan  
Steve Donovan

3-31-05  
Date

Field Activities Validation Lead:

Jeff Price  
Jeff Price

3/31/05  
Date

**Attachment 1**  
**Data Presentation**



## **Minimums and Maximums Report**

## **Minimums and Maximums Report**

The Minimums and Maximums Report is generated by a data validation application (DataVal) used to query the SEEPro database. The DataVal compares the new data set with historical data and lists all new data that fall outside the historical data range. Values listed in the report are further screened using the following criteria. Results are not considered anomalous if (1) identified low concentrations are the result of low detection limits; (2) the concentration detected is within 50 percent of historical minimum or maximum values; (3) there were fewer than 5 historical samples for comparison.

Chloride, sulfate, TDS, and uranium results for well 403 are the only anomalous values identified this sampling event. Well 403 is an observation well located between the river and the Configuration 1 pumping wells. The anomalously low values observed at well 403 are the result of mixing relatively clean river water with ground water. A reversal in the ground water flow gradient caused by the interim action pumping wells has induced a gradient reversal; therefore, these results are expected and acceptable. The time versus concentration plots show the decrease in concentrations as a result of the interim action pumping wells.

SAMPLING DATA VALIDATION MINIMUMS AND MAXIMUMS REPORT -- No Field Parameters

LAB CODE: PAR, PARAGON (Fort Collins, CO)

LAB REQUISITION(S): 04110136

HISTORY BEGIN DATE: comparing to all historical data

REPORT DATE: 02/22/05 02:24:35: PM

SITE CODE	LOCATION CODE	SAMPLE DATE	ANALYTE	CURRENT			HISTORICAL MAXIMUM			HISTORICAL MINIMUM			COUNT	
				RESULT	QUALIFIERS LAB DATA		RESULT	QUALIFIERS LAB DATA		RESULT	QUALIFIERS LAB DATA		N	N BELOW DETECT
MOA01	0403	11/19/2004	Ammonia Total as N	69	F		930			130	F		10	0
MOA01	0403	11/19/2004	Chloride	300	F		6973.2			1000	F		10	0
MOA01	0403	11/19/2004	Sulfate	630	F		18802.3			1600	F		10	0
MOA01	0403	11/19/2004	Total Dissolved Solids	1500	F		19000	F		4000	F		9	0
MOA01	0403	11/19/2004	Uranium	0.2	F		3.392			0.52	F		10	0
MOA01	0407	11/18/2004	Ammonia Total as N	35	F		1360			53	F		11	0
MOA01	0407	11/18/2004	Chloride	150	F		5400	F		280	F		11	0
MOA01	0407	11/18/2004	Sulfate	380	F		12601.1			440	JF		11	0
MOA01	0407	11/18/2004	Total Dissolved Solids	920	F		19000	F		1100	JF		10	0
MOA01	0407	11/18/2004	Uranium	0.18	F		4.6316			0.19	E JF		11	0
MOA01	0475	11/18/2004	Sulfate	6500			10000	F		7600			13	0
MOA01	0475	11/18/2004	Uranium	2.1			3.2	F		2.3	J		13	0
MOA01	0476	11/18/2004	Ammonia Total as N	530			1100	F		560	F		13	0
MOA01	0476	11/18/2004	Sulfate	5300			9900			7800	F		13	0
MOA01	0476	11/18/2004	Total Dissolved Solids	12000			24000	F		14000	F		13	0
MOA01	0476	11/18/2004	Uranium	1.8			3.3	F		2.2	J		13	0
MOA01	0477	11/18/2004	Ammonia Total as N	500			1200	F		540	F		13	0
MOA01	0477	11/18/2004	Sulfate	5400			9800	F		7800	F		13	0
MOA01	0477	11/18/2004	Uranium	2			3.2	F		2.3	J		13	0
MOA01	0478	11/18/2004	Sulfate	6000			11000	F		7600			13	0
MOA01	0478	11/18/2004	Uranium	1.9			3.2	F		2.2	J		13	0
MOA01	0479	11/18/2004	Ammonia Total as N	590			1400	F		603	N		13	0

SAMPLING DATA VALIDATION MINIMUMS AND MAXIMUMS REPORT -- No Field Parameters

LAB CODE: PAR, PARAGON (Fort Collins, CO)

LAB REQUISITION(S): 04110136

HISTORY BEGIN DATE: comparing to all historical data

REPORT DATE: 02/22/05 02:24:35: PM

SITE CODE	LOCATION CODE	SAMPLE DATE	ANALYTE	CURRENT			HISTORICAL MAXIMUM			HISTORICAL MINIMUM			COUNT	
				RESULT	QUALIFIERS LAB DATA		RESULT	QUALIFIERS LAB DATA		RESULT	QUALIFIERS LAB DATA		N	N BELOW DETECT
MOA01	0479	11/18/2004	Sulfate	5300			10800			6800			13	0
MOA01	0479	11/18/2004	Uranium	1.5			3.3	F		2.3	J		13	0
MOA01	0483	11/19/2004	Ammonia Total as N	650	F		1500	F		870	F		9	0
MOA01	0483	11/19/2004	Chloride	4700	F		13000	F		4900	F		9	0
MOA01	0483	11/19/2004	Sulfate	6100	F		11000	F		7700	F		9	0
MOA01	0483	11/19/2004	Total Dissolved Solids	16000	F		34000	F		19000	F		9	0
MOA01	0483	11/19/2004	Uranium	1.6	F		3.3	F		1.9	JF		9	0
MOA01	0484	11/19/2004	Chloride	15000	F		14000	F		8470			11	0
MOA01	0484	11/19/2004	Uranium	2.3	F		3	F		2.6	JF		11	0
MOA01	0547	11/18/2004	Ammonia Total as N	700			950	J		720			5	0
MOA01	0547	11/18/2004	Sulfate	6700			9400			7900			5	0
MOA01	0548	11/18/2004	Ammonia Total as N	810			1400			1000			6	0
MOA01	0548	11/18/2004	Sulfate	8400			19000			11000			6	0
MOA01	0548	11/18/2004	Total Dissolved Solids	24000			44000			25000			6	0
MOA01	0548	11/18/2004	Uranium	2.6			6.2			3.6	J		6	0
MOA01	0559	11/19/2004	Ammonia Total as N	430	F		800	F		460	F		5	0
MOA01	0559	11/19/2004	Chloride	2600	F		6300	F		4400	F		5	0
MOA01	0559	11/19/2004	Total Dissolved Solids	11000	F		22000	F		12000	F		5	0

SAMPLING DATA VALIDATION MINIMUMS AND MAXIMUMS REPORT -- No Field Parameters

LAB CODE: PAR, PARAGON (Fort Collins, CO)

LAB REQUISITION(S): 04110136

HISTORY BEGIN DATE: comparing to all historical data

REPORT DATE: 02/22/05 02:24:35: PM

SITE CODE	LOCATION CODE	SAMPLE DATE	ANALYTE	CURRENT			HISTORICAL MAXIMUM			HISTORICAL MINIMUM			COUNT	
				RESULT	QUALIFIERS LAB DATA		RESULT	QUALIFIERS LAB DATA		RESULT	QUALIFIERS LAB DATA		N	BELOW DETECT

SAMPLE ID CODES: 000X = Filtered sample (0.45 µm). N00X = Unfiltered sample. X = replicate number.

LAB QUALIFIERS:

- \* Replicate analysis not within control limits.
- + Correlation coefficient for MSA < 0.995.
- A TIC is a suspected aldol-condensation product.
- B Inorganic: Result is between the IDL and CRDL. Organic: Analyte also found in method blank.
- E Inorganic: Estimate value because of interference, see case narrative. Organic: Analyte exceeded calibration range of the GC-MS.
- Z Laboratory defined (USEPA CLP organic) qualifier, see case narrative.
- H Holding time expired, value suspect.
- I Increased detection limit due to required dilution.
- C Pesticide result confirmed by GC-MS.
- M GFAA duplicate injection precision not met.
- N Inorganic or radiochemical: Spike sample recovery not within control limits. Organic: Tentatively identified compound (TIC).
- S Result determined by method of standard addition (MSA).
- U Analytical result below detection limit.
- W Post-digestion spike outside control limits while sample absorbance < 50% of analytical spike absorbance.
- D Analyte determined in diluted sample.
- P > 25% difference in detected pesticide or Arochlor concentrations between 2 columns.
- X Laboratory defined (USEPA CLP organic) qualifier, see case narrative.
- Y Laboratory defined (USEPA CLP organic) qualifier, see case narrative.
- > Result above upper detection limit.
- J Estimated

DATA QUALIFIERS:

- |  |  |   |
|--|--|---|
| J Estimated value.                                   | F Low flow sampling method used.               | G Possible grout contamination, pH > 9. |
| L Less than 3 bore volumes purged prior to sampling. | R Unusable result.                             | X Location is undefined.                |
| U Parameter analyzed for but was not detected.       | Q Qualitative result due to sampling technique |   |

## **Anomalous Data Review Checksheet**

## Anomalous Data Review Checksheet

Site: Moab Processing Site Sampling Date: November 18-19, 2004

Reviewer: Jeff Price *J. E. Price* 3/24/5  
Name Signature Date

Site Lead: Kenneth Karp *Kenneth Karp* 3-24-05  
Name Signature Date

Loc. No.	Analyte	Type of Anomaly	Disposition
<u>0403</u>	<u>Chloride</u>	<u>Low</u>	<u>Due to pumping – results acceptable</u>
<u>0403</u>	<u>Sulfate</u>	<u>Low</u>	<u>Due to pumping – results acceptable</u>
<u>0403</u>	<u>TDS</u>	<u>Low</u>	<u>Due to pumping – results acceptable</u>
<u>0403</u>	<u>Uranium</u>	<u>Low</u>	<u>Due to pumping – results acceptable</u>

## **Water Quality Data**



GENERAL WATER QUALITY DATA BY PARAMETER (USEE205) FOR SITE MOA01, Moab Site  
 REPORT DATE: 2/22/2005 2:29 pm

PARAMETER	UNITS	LOCATION ID	LOC TYPE, SUBTYPE	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB DATA QA	DETECTION LIMIT	UN-CERTAINTY
Alkalinity, Total (As CaCO3	mg/L	0216	SL, RIV	11/18/2004	0001	0.20 - 0.20	158		#	-
	mg/L	0236	SL, RIV	11/18/2004	0001	0.25 - 0.25	630		#	-
	mg/L	0403	WL	11/19/2004	0001	18.00 - 18.00	226	F	#	-
	mg/L	0407	WL	11/18/2004	0001	17.00 - 17.00	220	F	#	-
	mg/L	0470	WL, EXT	11/18/2004	0001	10.30 - 19.70	646		#	-
	mg/L	0471	WL, EXT	11/18/2004	0001	10.30 - 19.70	700		#	-
	mg/L	0472	WL, EXT	11/18/2004	0001	10.30 - 19.70	716		#	-
	mg/L	0473	WL, EXT	11/18/2004	0001	10.30 - 19.70	744		#	-
	mg/L	0474	WL, EXT	11/18/2004	0001	10.30 - 19.70	812		#	-
	mg/L	0475	WL, EXT	11/18/2004	0001	10.30 - 19.70	726		#	-
	mg/L	0476	WL, EXT	11/18/2004	0001	10.30 - 19.70	664		#	-
	mg/L	0477	WL, EXT	11/18/2004	0001	10.30 - 19.70	680		#	-
	mg/L	0478	WL, EXT	11/18/2004	0001	9.60 - 23.90	746		#	-
	mg/L	0479	WL, EXT	11/18/2004	0001	9.30 - 23.60	680		#	-
	mg/L	0483	WL	11/19/2004	0001	18.00 - 18.00	622	F	#	-
	mg/L	0484	WL	11/19/2004	0001	28.00 - 28.00	780	F	#	-
	mg/L	0547	TS, INFL	11/18/2004	0001	0.00 - 0.00	690		#	-
	mg/L	0548	TS, EPND	11/18/2004	0001	0.00 - 0.00	470		#	-
	mg/L	0557	WL	11/19/2004	0001	40.00 - 40.00	804	F	#	-
	mg/L	0559	WL	11/19/2004	0001	20.00 - 20.00	536	F	#	-
	mg/L	0560	WL	11/19/2004	0001	31.00 - 31.00	430	F	#	-
Ammonia Total as N	mg/L	0216	SL, RIV	11/18/2004	0001	0.20 - 0.20	6.4		#	0.2
	mg/L	0236	SL, RIV	11/18/2004	0001	0.25 - 0.25	290		#	50
	mg/L	0236	SL, RIV	11/18/2004	0002	0.25 - 0.25	270		#	50
	mg/L	0403	WL	11/19/2004	0001	18.00 - 18.00	69	F	#	2
	mg/L	0407	WL	11/18/2004	0001	17.00 - 17.00	35	F	#	2

GENERAL WATER QUALITY DATA BY PARAMETER (USEE205) FOR SITE MOA01, Moab Site  
 REPORT DATE: 2/22/2005 2:29 pm

PARAMETER	UNITS	LOCATION ID	LOC TYPE, SUBTYPE	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB DATA QA	DETECTION LIMIT	UN-CERTAINTY	
Ammonia Total as N	mg/L	0470	WL, EXT	11/18/2004	0001	10.30 - 19.70	700		#	50	-
	mg/L	0471	WL, EXT	11/18/2004	0001	10.30 - 19.70	800		#	50	-
	mg/L	0472	WL, EXT	11/18/2004	0001	10.30 - 19.70	860		#	50	-
	mg/L	0473	WL, EXT	11/18/2004	0001	10.30 - 19.70	830		#	50	-
	mg/L	0474	WL, EXT	11/18/2004	0001	10.30 - 19.70	860		#	50	-
	mg/L	0475	WL, EXT	11/18/2004	0001	10.30 - 19.70	630		#	50	-
	mg/L	0476	WL, EXT	11/18/2004	0001	10.30 - 19.70	530		#	50	-
	mg/L	0477	WL, EXT	11/18/2004	0001	10.30 - 19.70	500		#	50	-
	mg/L	0478	WL, EXT	11/18/2004	0001	9.60 - 23.90	650		#	50	-
	mg/L	0479	WL, EXT	11/18/2004	0001	9.30 - 23.60	590		#	50	-
	mg/L	0483	WL	11/19/2004	0001	18.00 - 18.00	650	F	#	50	-
	mg/L	0484	WL	11/19/2004	0001	28.00 - 28.00	1500	F	#	50	-
	mg/L	0547	TS, INFL	11/18/2004	0001	0.00 - 0.00	700		#	50	-
	mg/L	0548	TS, EPND	11/18/2004	0001	0.00 - 0.00	810		#	50	-
	mg/L	0557	WL	11/19/2004	0001	40.00 - 40.00	1300	F	#	50	-
	mg/L	0559	WL	11/19/2004	0001	20.00 - 20.00	430	F	#	50	-
	mg/L	0560	WL	11/19/2004	0001	31.00 - 31.00	1800	F	#	50	-
	mg/L	0563	WL, PZ	11/18/2004	0001	3.95 - 3.95	56	FQ	#	2	-
	mg/L	0565	WL, PZ	11/18/2004	0001	4.32 - 4.32	47	FQ	#	2	-
	Chloride	mg/L	0216	SL, RIV	11/18/2004	0001	0.20 - 0.20	130		#	4
mg/L		0236	SL, RIV	11/18/2004	0001	0.25 - 0.25	1500		#	40	-
mg/L		0236	SL, RIV	11/18/2004	0002	0.25 - 0.25	1500		#	40	-
mg/L		0403	WL	11/19/2004	0001	18.00 - 18.00	300	F	#	10	-
mg/L		0407	WL	11/18/2004	0001	17.00 - 17.00	150	F	#	4	-
mg/L		0470	WL, EXT	11/18/2004	0001	10.30 - 19.70	5900		#	100	-
mg/L		0471	WL, EXT	11/18/2004	0001	10.30 - 19.70	8600		#	100	-

GENERAL WATER QUALITY DATA BY PARAMETER (USEE205) FOR SITE MOA01, Moab Site  
REPORT DATE: 2/22/2005 2:29 pm

PARAMETER	UNITS	LOCATION ID	LOC TYPE, SUBTYPE	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB DATA QA	DETECTION LIMIT	UN-CERTAINTY	
Chloride	mg/L	0472	WL, EXT	11/18/2004	0001	10.30 - 19.70	6600		#	100	-
	mg/L	0473	WL, EXT	11/18/2004	0001	10.30 - 19.70	5300		#	100	-
	mg/L	0474	WL, EXT	11/18/2004	0001	10.30 - 19.70	5400		#	100	-
	mg/L	0475	WL, EXT	11/18/2004	0001	10.30 - 19.70	3300		#	40	-
	mg/L	0476	WL, EXT	11/18/2004	0001	10.30 - 19.70	2500		#	40	-
	mg/L	0477	WL, EXT	11/18/2004	0001	10.30 - 19.70	2400		#	40	-
	mg/L	0478	WL, EXT	11/18/2004	0001	9.60 - 23.90	4400		#	100	-
	mg/L	0479	WL, EXT	11/18/2004	0001	9.30 - 23.60	3700		#	40	-
	mg/L	0483	WL	11/19/2004	0001	18.00 - 18.00	4700	F	#	100	-
	mg/L	0484	WL	11/19/2004	0001	28.00 - 28.00	15000	F	#	400	-
	mg/L	0547	TS, INFL	11/18/2004	0001	0.00 - 0.00	5000		#	100	-
	mg/L	0548	TS, EPND	11/18/2004	0001	0.00 - 0.00	7400		#	100	-
	mg/L	0557	WL	11/19/2004	0001	40.00 - 40.00	11000	F	#	400	-
	mg/L	0559	WL	11/19/2004	0001	20.00 - 20.00	2600	F	#	40	-
	mg/L	0560	WL	11/19/2004	0001	31.00 - 31.00	37000	F	#	1000	-
	mg/L	0563	WL, PZ	11/18/2004	0001	3.95 - 3.95	230	FQ	#	4	-
	mg/L	0565	WL, PZ	11/18/2004	0001	4.32 - 4.32	400	FQ	#	10	-
Oxidation Reduction Potent	mV	0216	SL, RIV	11/18/2004	N001	0.20 - 0.20	34		#	-	-
	mV	0236	SL, RIV	11/18/2004	N001	0.25 - 0.25	81		#	-	-
	mV	0244	SL, RIV	11/18/2004	N001	0.25 - 0.25	193.1		#	-	-
	mV	0245	SL, RIV	11/18/2004	N001	0.30 - 0.30	155.2		#	-	-
	mV	0403	WL	11/19/2004	N001	18.00 - 18.00	12	F	#	-	-
	mV	0407	WL	11/18/2004	N001	17.00 - 17.00	-100	F	#	-	-
	mV	0470	WL, EXT	11/18/2004	N001	10.30 - 19.70	114		#	-	-
	mV	0471	WL, EXT	11/18/2004	N001	10.30 - 19.70	112		#	-	-
	mV	0472	WL, EXT	11/18/2004	N001	10.30 - 19.70	105		#	-	-

GENERAL WATER QUALITY DATA BY PARAMETER (USEE205) FOR SITE MOA01, Moab Site  
REPORT DATE: 2/22/2005 2:29 pm

PARAMETER	UNITS	LOCATION ID	LOC TYPE, SUBTYPE	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB DATA QA	DETECTION LIMIT	UN-CERTAINTY
Oxidation Reduction Potent	mV	0473	WL, EXT	11/18/2004	N001	10.30 - 19.70	106		#	-
	mV	0474	WL, EXT	11/18/2004	N001	10.30 - 19.70	99		#	-
	mV	0475	WL, EXT	11/18/2004	N001	10.30 - 19.70	81		#	-
	mV	0476	WL, EXT	11/18/2004	N001	10.30 - 19.70	104		#	-
	mV	0477	WL, EXT	11/18/2004	N001	10.30 - 19.70	99		#	-
	mV	0478	WL, EXT	11/18/2004	N001	9.60 - 23.90	98		#	-
	mV	0479	WL, EXT	11/18/2004	N001	9.30 - 23.60	100		#	-
	mV	0483	WL	11/19/2004	N001	18.00 - 18.00	32	F	#	-
	mV	0484	WL	11/19/2004	N001	28.00 - 28.00	50	F	#	-
	mV	0557	WL	11/19/2004	N001	40.00 - 40.00	131	F	#	-
	mV	0559	WL	11/19/2004	N001	20.00 - 20.00	83	F	#	-
	mV	0560	WL	11/19/2004	N001	31.00 - 31.00	94	F	#	-
	mV	0562	WL, PZ	11/18/2004	N001	1.53 - 1.53	187		#	-
	mV	0563	WL, PZ	11/18/2004	N001	3.95 - 3.95	96	FQ	#	-
	mV	0564	WL, PZ	11/18/2004	N001	1.32 - 1.32	90	FQ	#	-
	mV	0565	WL, PZ	11/18/2004	N001	4.32 - 4.32	84	FQ	#	-
	mV	0580	WL	11/19/2004	N001	18.00 - 18.00	36		#	-
pH	s.u.	0216	SL, RIV	11/18/2004	N001	0.20 - 0.20	8.37		#	-
	s.u.	0236	SL, RIV	11/18/2004	N001	0.25 - 0.25	7.69		#	-
	s.u.	0244	SL, RIV	11/18/2004	N001	0.25 - 0.25	7.89		#	-
	s.u.	0245	SL, RIV	11/18/2004	N001	0.30 - 0.30	8.12		#	-
	s.u.	0403	WL	11/19/2004	N001	18.00 - 18.00	7.83	F	#	-
	s.u.	0407	WL	11/18/2004	N001	17.00 - 17.00	7.70	F	#	-
	s.u.	0470	WL, EXT	11/18/2004	N001	10.30 - 19.70	7.03		#	-
	s.u.	0471	WL, EXT	11/18/2004	N001	10.30 - 19.70	6.98		#	-
	s.u.	0472	WL, EXT	11/18/2004	N001	10.30 - 19.70	7.00		#	-

GENERAL WATER QUALITY DATA BY PARAMETER (USEE205) FOR SITE MOA01, Moab Site  
REPORT DATE: 2/22/2005 2:29 pm

PARAMETER	UNITS	LOCATION ID	LOC TYPE, SUBTYPE	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB DATA QA	DETECTION LIMIT	UN-CERTAINTY
pH	s.u.	0473	WL, EXT	11/18/2004	N001	10.30 - 19.70	7.00		#	-
	s.u.	0474	WL, EXT	11/18/2004	N001	10.30 - 19.70	6.95		#	-
	s.u.	0475	WL, EXT	11/18/2004	N001	10.30 - 19.70	6.98		#	-
	s.u.	0476	WL, EXT	11/18/2004	N001	10.30 - 19.70	6.98		#	-
	s.u.	0477	WL, EXT	11/18/2004	N001	10.30 - 19.70	6.95		#	-
	s.u.	0478	WL, EXT	11/18/2004	N001	9.60 - 23.90	6.94		#	-
	s.u.	0479	WL, EXT	11/18/2004	N001	9.30 - 23.60	6.98		#	-
	s.u.	0483	WL	11/19/2004	N001	18.00 - 18.00	7.24	F	#	-
	s.u.	0484	WL	11/19/2004	N001	28.00 - 28.00	7.11	F	#	-
	s.u.	0547	TS, INFL	11/18/2004	N001	0.00 - 0.00	6.75		#	-
	s.u.	0548	TS, EPND	11/18/2004	N001	0.00 - 0.00	7.67		#	-
	s.u.	0557	WL	11/19/2004	N001	40.00 - 40.00	7.20	F	#	-
	s.u.	0559	WL	11/19/2004	N001	20.00 - 20.00	7.33	F	#	-
	s.u.	0560	WL	11/19/2004	N001	31.00 - 31.00	6.99	F	#	-
	s.u.	0562	WL, PZ	11/18/2004	N001	1.53 - 1.53	7.62		#	-
	s.u.	0563	WL, PZ	11/18/2004	N001	3.95 - 3.95	9.01	FQ	#	-
	s.u.	0564	WL, PZ	11/18/2004	N001	1.32 - 1.32	8.32	FQ	#	-
	s.u.	0565	WL, PZ	11/18/2004	N001	4.32 - 4.32	8.84	FQ	#	-
	s.u.	0580	WL	11/19/2004	N001	18.00 - 18.00	7.34		#	-
Specific Conductance	umhos/cm	0216	SL, RIV	11/18/2004	N001	0.20 - 0.20	1609		#	-
	umhos/cm	0236	SL, RIV	11/18/2004	N001	0.25 - 0.25	14675		#	-
	umhos/cm	0244	SL, RIV	11/18/2004	N001	0.25 - 0.25	1836		#	-
	umhos/cm	0245	SL, RIV	11/18/2004	N001	0.30 - 0.30	1198		#	-
	umhos/cm	0403	WL	11/19/2004	N001	18.00 - 18.00	2807	F	#	-
	umhos/cm	0407	WL	11/18/2004	N001	17.00 - 17.00	1701	F	#	-
	umhos/cm	0470	WL, EXT	11/18/2004	N001	10.30 - 19.70	27051		#	-

GENERAL WATER QUALITY DATA BY PARAMETER (USEE205) FOR SITE MOA01, Moab Site  
REPORT DATE: 2/22/2005 2:29 pm

PARAMETER	UNITS	LOCATION ID	LOC TYPE, SUBTYPE	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB DATA QA	DETECTION LIMIT	UN-CERTAINTY
Specific Conductance	umhos/cm	0471	WL, EXT	11/18/2004	N001	10.30 - 19.70	33400		#	-
	umhos/cm	0472	WL, EXT	11/18/2004	N001	10.30 - 19.70	29650		#	-
	umhos/cm	0473	WL, EXT	11/18/2004	N001	10.30 - 19.70	26995		#	-
	umhos/cm	0474	WL, EXT	11/18/2004	N001	10.30 - 19.70	27310		#	-
	umhos/cm	0475	WL, EXT	11/18/2004	N001	10.30 - 19.70	20430		#	-
	umhos/cm	0476	WL, EXT	11/18/2004	N001	10.30 - 19.70	16850		#	-
	umhos/cm	0477	WL, EXT	11/18/2004	N001	10.30 - 19.70	16620		#	-
	umhos/cm	0478	WL, EXT	11/18/2004	N001	9.60 - 23.90	22690		#	-
	umhos/cm	0479	WL, EXT	11/18/2004	N001	9.30 - 23.60	20395		#	-
	umhos/cm	0483	WL	11/19/2004	N001	18.00 - 18.00	22995	F	#	-
	umhos/cm	0484	WL	11/19/2004	N001	28.00 - 28.00	51025	F	#	-
	umhos/cm	0547	TS, INFL	11/18/2004	N001	0.00 - 0.00	25770		#	-
	umhos/cm	0548	TS, EPND	11/18/2004	N001	0.00 - 0.00	33640		#	-
	umhos/cm	0557	WL	11/19/2004	N001	40.00 - 40.00	43935	F	#	-
	umhos/cm	0559	WL	11/19/2004	N001	20.00 - 20.00	15925	F	#	-
	umhos/cm	0560	WL	11/19/2004	N001	31.00 - 31.00	98850	F	#	-
	umhos/cm	0562	WL, PZ	11/18/2004	N001	1.53 - 1.53	1760		#	-
	umhos/cm	0563	WL, PZ	11/18/2004	N001	3.95 - 3.95	3270	FQ	#	-
	umhos/cm	0564	WL, PZ	11/18/2004	N001	1.32 - 1.32	910	FQ	#	-
	umhos/cm	0565	WL, PZ	11/18/2004	N001	4.32 - 4.32	3945	FQ	#	-
	umhos/cm	0580	WL	11/19/2004	N001	18.00 - 18.00	3925		#	-
Sulfate	mg/L	0216	SL, RIV	11/18/2004	0001	0.20 - 0.20	400		#	10
	mg/L	0236	SL, RIV	11/18/2004	0001	0.25 - 0.25	5700		#	100
	mg/L	0236	SL, RIV	11/18/2004	0002	0.25 - 0.25	5700		#	100
	mg/L	0403	WL	11/19/2004	0001	18.00 - 18.00	630	F	#	25
	mg/L	0407	WL	11/18/2004	0001	17.00 - 17.00	380	F	#	10

GENERAL WATER QUALITY DATA BY PARAMETER (USEE205) FOR SITE MOA01, Moab Site  
REPORT DATE: 2/22/2005 2:29 pm

PARAMETER	UNITS	LOCATION ID	LOC TYPE, SUBTYPE	SAMPLE: DATE ID		DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB DATA QA			DETECTION LIMIT	UN-CERTAINTY	
Sulfate	mg/L	0470	WL, EXT	11/18/2004	0001	10.30 - 19.70	6900				#	250	-
	mg/L	0471	WL, EXT	11/18/2004	0001	10.30 - 19.70	8100				#	250	-
	mg/L	0472	WL, EXT	11/18/2004	0001	10.30 - 19.70	7400				#	250	-
	mg/L	0473	WL, EXT	11/18/2004	0001	10.30 - 19.70	7500				#	250	-
	mg/L	0474	WL, EXT	11/18/2004	0001	10.30 - 19.70	7900				#	250	-
	mg/L	0475	WL, EXT	11/18/2004	0001	10.30 - 19.70	6500				#	100	-
	mg/L	0476	WL, EXT	11/18/2004	0001	10.30 - 19.70	5300				#	100	-
	mg/L	0477	WL, EXT	11/18/2004	0001	10.30 - 19.70	5400				#	100	-
	mg/L	0478	WL, EXT	11/18/2004	0001	9.60 - 23.90	6000				#	100	-
	mg/L	0479	WL, EXT	11/18/2004	0001	9.30 - 23.60	5300				#	100	-
	mg/L	0483	WL	11/19/2004	0001	18.00 - 18.00	6100		F		#	100	-
	mg/L	0484	WL	11/19/2004	0001	28.00 - 28.00	10000		F		#	250	-
	mg/L	0547	TS, INFL	11/18/2004	0001	0.00 - 0.00	6700				#	100	-
	mg/L	0548	TS, EPND	11/18/2004	0001	0.00 - 0.00	8400				#	250	-
	mg/L	0557	WL	11/19/2004	0001	40.00 - 40.00	10000		F		#	250	-
	mg/L	0559	WL	11/19/2004	0001	20.00 - 20.00	4600		F		#	100	-
	mg/L	0560	WL	11/19/2004	0001	31.00 - 31.00	8100		F		#	500	-
	mg/L	0563	WL, PZ	11/18/2004	0001	3.95 - 3.95	450		FQ		#	10	-
	mg/L	0565	WL, PZ	11/18/2004	0001	4.32 - 4.32	670		FQ		#	25	-
	Temperature	C	0216	SL, RIV	11/18/2004	N001	0.20 - 0.20	10.13				#	-
C		0236	SL, RIV	11/18/2004	N001	0.25 - 0.25	17.42				#	-	-
C		0244	SL, RIV	11/18/2004	N001	0.25 - 0.25	10.72				#	-	-
C		0245	SL, RIV	11/18/2004	N001	0.30 - 0.30	9.72				#	-	-
C		0403	WL	11/19/2004	N001	18.00 - 18.00	14.03		F		#	-	-
C		0407	WL	11/18/2004	N001	17.00 - 17.00	16.77		F		#	-	-
C		0470	WL, EXT	11/18/2004	N001	10.30 - 19.70	16.72				#	-	-

GENERAL WATER QUALITY DATA BY PARAMETER (USEE205) FOR SITE MOA01, Moab Site  
REPORT DATE: 2/22/2005 2:29 pm

PARAMETER	UNITS	LOCATION ID	LOC TYPE, SUBTYPE	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB DATA QA	DETECTION LIMIT	UN-CERTAINTY
Temperature	C	0471	WL, EXT	11/18/2004	N001	10.30 - 19.70	16.27		#	-
	C	0472	WL, EXT	11/18/2004	N001	10.30 - 19.70	16.63		#	-
	C	0473	WL, EXT	11/18/2004	N001	10.30 - 19.70	17.02		#	-
	C	0474	WL, EXT	11/18/2004	N001	10.30 - 19.70	16.72		#	-
	C	0475	WL, EXT	11/18/2004	N001	10.30 - 19.70	16.84		#	-
	C	0476	WL, EXT	11/18/2004	N001	10.30 - 19.70	17.47		#	-
	C	0477	WL, EXT	11/18/2004	N001	10.30 - 19.70	16.94		#	-
	C	0478	WL, EXT	11/18/2004	N001	9.60 - 23.90	16.70		#	-
	C	0479	WL, EXT	11/18/2004	N001	9.30 - 23.60	16.78		#	-
	C	0483	WL	11/19/2004	N001	18.00 - 18.00	16.17	F	#	-
	C	0484	WL	11/19/2004	N001	28.00 - 28.00	15.25	F	#	-
	C	0547	TS, INFL	11/18/2004	N001	0.00 - 0.00	16.95		#	-
	C	0548	TS, EPND	11/18/2004	N001	0.00 - 0.00	12.05		#	-
	C	0557	WL	11/19/2004	N001	40.00 - 40.00	13.51	F	#	-
	C	0559	WL	11/19/2004	N001	20.00 - 20.00	16.44	F	#	-
	C	0560	WL	11/19/2004	N001	31.00 - 31.00	14.50	F	#	-
	C	0562	WL, PZ	11/18/2004	N001	1.53 - 1.53	14.42		#	-
	C	0563	WL, PZ	11/18/2004	N001	3.95 - 3.95	11.32	FQ	#	-
	C	0564	WL, PZ	11/18/2004	N001	1.32 - 1.32	10.76	FQ	#	-
	C	0565	WL, PZ	11/18/2004	N001	4.32 - 4.32	10.57	FQ	#	-
	C	0580	WL	11/19/2004	N001	18.00 - 18.00	15.36		#	-
Total Dissolved Solids	mg/L	0216	SL, RIV	11/18/2004	0001	0.20 - 0.20	1000		#	40
	mg/L	0236	SL, RIV	11/18/2004	0001	0.25 - 0.25	11000		#	400
	mg/L	0236	SL, RIV	11/18/2004	0002	0.25 - 0.25	11000		#	400
	mg/L	0403	WL	11/19/2004	0001	18.00 - 18.00	1500	F	#	40
	mg/L	0407	WL	11/18/2004	0001	17.00 - 17.00	920	F	#	40



GENERAL WATER QUALITY DATA BY PARAMETER (USEE205) FOR SITE MOA01, Moab Site  
REPORT DATE: 2/22/2005 2:29 pm

PARAMETER	UNITS	LOCATION ID	LOC TYPE, SUBTYPE	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB DATA QA	DETECTION LIMIT	UN-CERTAINTY	
Total Dissolved Solids	mg/L	0470	WL, EXT	11/18/2004	0001	10.30 - 19.70	19000		#	400	-
	mg/L	0471	WL, EXT	11/18/2004	0001	10.30 - 19.70	24000		#	400	-
	mg/L	0472	WL, EXT	11/18/2004	0001	10.30 - 19.70	21000		#	400	-
	mg/L	0473	WL, EXT	11/18/2004	0001	10.30 - 19.70	19000		#	400	-
	mg/L	0474	WL, EXT	11/18/2004	0001	10.30 - 19.70	20000		#	400	-
	mg/L	0475	WL, EXT	11/18/2004	0001	10.30 - 19.70	15000		#	400	-
	mg/L	0476	WL, EXT	11/18/2004	0001	10.30 - 19.70	12000		#	400	-
	mg/L	0477	WL, EXT	11/18/2004	0001	10.30 - 19.70	12000		#	400	-
	mg/L	0478	WL, EXT	11/18/2004	0001	9.60 - 23.90	16000		#	400	-
	mg/L	0479	WL, EXT	11/18/2004	0001	9.30 - 23.60	14000		#	400	-
	mg/L	0483	WL	11/19/2004	0001	18.00 - 18.00	16000	F	#	400	-
	mg/L	0484	WL	11/19/2004	0001	28.00 - 28.00	36000	F	#	1000	-
	mg/L	0547	TS, INFL	11/18/2004	0001	0.00 - 0.00	18000		#	400	-
	mg/L	0548	TS, EPND	11/18/2004	0001	0.00 - 0.00	24000		#	400	-
	mg/L	0557	WL	11/19/2004	0001	40.00 - 40.00	31000	F	#	1000	-
	mg/L	0559	WL	11/19/2004	0001	20.00 - 20.00	11000	F	#	400	-
	mg/L	0560	WL	11/19/2004	0001	31.00 - 31.00	68000	F	#	2000	-
	mg/L	0563	WL, PZ	11/18/2004	0001	3.95 - 3.95	1100	FQ	#	50	-
	mg/L	0564	WL, PZ	11/18/2004	0001	1.32 - 1.32	540	FQ	#	250	-
	mg/L	0565	WL, PZ	11/18/2004	0001	4.32 - 4.32	2000	FQ	#	80	-
Turbidity	NTU	0216	SL, RIV	11/18/2004	N001	0.20 - 0.20	104		#	-	-
	NTU	0236	SL, RIV	11/18/2004	N001	0.25 - 0.25	17.6		#	-	-
	NTU	0244	SL, RIV	11/18/2004	N001	0.25 - 0.25	104		#	-	-
	NTU	0245	SL, RIV	11/18/2004	N001	0.30 - 0.30	70.5		#	-	-
	NTU	0403	WL	11/19/2004	N001	18.00 - 18.00	3.34	F	#	-	-
	NTU	0407	WL	11/18/2004	N001	17.00 - 17.00	4.61	F	#	-	-

GENERAL WATER QUALITY DATA BY PARAMETER (USEE205) FOR SITE MOA01, Moab Site  
REPORT DATE: 2/22/2005 2:29 pm

PARAMETER	UNITS	LOCATION ID	LOC TYPE, SUBTYPE	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB DATA QA	DETECTION LIMIT	UN-CERTAINTY
Turbidity	NTU	0470	WL, EXT	11/18/2004	N001	10.30 - 19.70	4.89		#	-
	NTU	0471	WL, EXT	11/18/2004	N001	10.30 - 19.70	8.97		#	-
	NTU	0472	WL, EXT	11/18/2004	N001	10.30 - 19.70	1.40		#	-
	NTU	0473	WL, EXT	11/18/2004	N001	10.30 - 19.70	0.96		#	-
	NTU	0474	WL, EXT	11/18/2004	N001	10.30 - 19.70	1.30		#	-
	NTU	0475	WL, EXT	11/18/2004	N001	10.30 - 19.70	3.34		#	-
	NTU	0476	WL, EXT	11/18/2004	N001	10.30 - 19.70	2.25		#	-
	NTU	0477	WL, EXT	11/18/2004	N001	10.30 - 19.70	2.79		#	-
	NTU	0478	WL, EXT	11/18/2004	N001	9.60 - 23.90	2.22		#	-
	NTU	0479	WL, EXT	11/18/2004	N001	9.30 - 23.60	1.55		#	-
	NTU	0483	WL	11/19/2004	N001	18.00 - 18.00	3.15	F	#	-
	NTU	0484	WL	11/19/2004	N001	28.00 - 28.00	7.98	F	#	-
	NTU	0547	TS, INFL	11/18/2004	N001	0.00 - 0.00	1.03		#	-
	NTU	0548	TS, EPND	11/18/2004	N001	0.00 - 0.00	5.47		#	-
	NTU	0557	WL	11/19/2004	N001	40.00 - 40.00	2.46	F	#	-
	NTU	0559	WL	11/19/2004	N001	20.00 - 20.00	2.33	F	#	-
	NTU	0560	WL	11/19/2004	N001	31.00 - 31.00	2.50	F	#	-
	NTU	0562	WL, PZ	11/18/2004	N001	1.53 - 1.53	139		#	-
	NTU	0563	WL, PZ	11/18/2004	N001	3.95 - 3.95	308	FQ	#	-
	NTU	0564	WL, PZ	11/18/2004	N001	1.32 - 1.32	876	FQ	#	-
	NTU	0565	WL, PZ	11/18/2004	N001	4.32 - 4.32	1000	> FQ	#	-
Uranium	mg/L	0216	SL, RIV	11/18/2004	0001	0.20 - 0.20	0.050		#	4.2E-05
	mg/L	0236	SL, RIV	11/18/2004	0001	0.25 - 0.25	1.600		#	0.00083
	mg/L	0236	SL, RIV	11/18/2004	0002	0.25 - 0.25	2.200		#	0.00083
	mg/L	0403	WL	11/19/2004	0001	18.00 - 18.00	0.200	F	#	4.2E-05
	mg/L	0407	WL	11/18/2004	0001	17.00 - 17.00	0.180	F	#	4.2E-05

GENERAL WATER QUALITY DATA BY PARAMETER (USEE205) FOR SITE MOA01, Moab Site  
 REPORT DATE: 2/22/2005 2:29 pm

PARAMETER	UNITS	LOCATION ID	LOC TYPE, SUBTYPE	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB DATA QA	DETECTION LIMIT	UN- CERTAINTY
Uranium	mg/L	0470	WL, EXT	11/18/2004	0001	10.30 - 19.70	2.200	E	# 0.00083	-
	mg/L	0471	WL, EXT	11/18/2004	0001	10.30 - 19.70	2.000		# 0.00083	-
	mg/L	0472	WL, EXT	11/18/2004	0001	10.30 - 19.70	2.400		# 0.00083	-
	mg/L	0473	WL, EXT	11/18/2004	0001	10.30 - 19.70	2.800		# 0.00083	-
	mg/L	0474	WL, EXT	11/18/2004	0001	10.30 - 19.70	2.900		# 0.00083	-
	mg/L	0475	WL, EXT	11/18/2004	0001	10.30 - 19.70	2.100		# 0.00083	-
	mg/L	0476	WL, EXT	11/18/2004	0001	10.30 - 19.70	1.800		# 0.00083	-
	mg/L	0477	WL, EXT	11/18/2004	0001	10.30 - 19.70	2.000		# 0.00083	-
	mg/L	0478	WL, EXT	11/18/2004	0001	9.60 - 23.90	1.900		# 0.00083	-
	mg/L	0479	WL, EXT	11/18/2004	0001	9.30 - 23.60	1.500		# 0.00083	-
	mg/L	0483	WL	11/19/2004	0001	18.00 - 18.00	1.600	F	# 0.00083	-
	mg/L	0484	WL	11/19/2004	0001	28.00 - 28.00	2.300	F	# 0.00083	-
	mg/L	0547	TS, INFL	11/18/2004	0001	0.00 - 0.00	2.300		# 0.00083	-
	mg/L	0548	TS, EPND	11/18/2004	0001	0.00 - 0.00	2.600		# 0.00083	-
	mg/L	0557	WL	11/19/2004	0001	40.00 - 40.00	3.000	F	# 0.00083	-
	mg/L	0559	WL	11/19/2004	0001	20.00 - 20.00	1.400	F	# 0.00083	-
	mg/L	0560	WL	11/19/2004	0001	31.00 - 31.00	1.500	F	# 0.00083	-
	mg/L	0563	WL, PZ	11/18/2004	0001	3.95 - 3.95	0.016	FQ	# 4.2E-05	-
	mg/L	0565	WL, PZ	11/18/2004	0001	4.32 - 4.32	0.00035	FQ	# 8.3E-06	-

GENERAL WATER QUALITY DATA BY PARAMETER (USEE205) FOR SITE MOA01, Moab Site  
 REPORT DATE: 2/22/2005 2:29 pm

PARAMETER	UNITS	LOCATION ID	LOC TYPE, SUBTYPE	SAMPLE: DATE ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB DATA QA	DETECTION LIMIT	UN-CERTAINTY
RECORDS: SELECTED FROM USEE200 WHERE site_code='MOA01' AND quality_assurance = TRUE AND (data_validation_qualifiers IS NULL OR data_validation_qualifiers NOT LIKE '%R%' AND data_validation_qualifiers NOT LIKE '%X%') AND DATE_SAMPLED between #11/18/2004# and #11/19/2004#									
SAMPLE ID CODES: 000X = Filtered sample (0.45 µm). N00X = Unfiltered sample. X = replicate number.									
LOCATION TYPES: SL SURFACE LOCATION TS TREATMENT SYSTEM WL WELL									
LOCATION SUBTYPES: EPND Evaporation Pond EXT Extraction Well INFL Treatment System Influent PZ Piezometer RIV River									
LAB QUALIFIERS:									
<ul style="list-style-type: none"> <li>• Replicate analysis not within control limits.</li> <li>+ Correlation coefficient for MSA &lt; 0.995.</li> <li>&gt; Result above upper detection limit.</li> <li>A TIC is a suspected aldol-condensation product.</li> <li>B Inorganic: Result is between the IDL and CRDL. Organic: Analyte also found in method blank.</li> <li>C Pesticide result confirmed by GC-MS.</li> <li>D Analyte determined in diluted sample.</li> <li>E Inorganic: Estimate value because of interference, see case narrative. Organic: Analyte exceeded calibration range of the GC-MS.</li> <li>H Holding time expired, value suspect.</li> <li>I Increased detection limit due to required dilution.</li> <li>J Estimated</li> <li>M GFAA duplicate injection precision not met.</li> <li>N Inorganic or radiochemical: Spike sample recovery not within control limits. Organic: Tentatively identified compound (TIC).</li> <li>P &gt; 25% difference in detected pesticide or Arochlor concentrations between 2 columns.</li> <li>S Result determined by method of standard addition (MSA).</li> <li>U Analytical result below detection limit.</li> <li>W Post-digestion spike outside control limits while sample absorbance &lt; 50% of analytical spike absorbance.</li> <li>X Laboratory defined (USEPA CLP organic) qualifier, see case narrative.</li> <li>Y Laboratory defined (USEPA CLP organic) qualifier, see case narrative.</li> <li>Z Laboratory defined (USEPA CLP organic) qualifier, see case narrative.</li> </ul>									
DATA QUALIFIERS:									
<ul style="list-style-type: none"> <li>F Low flow sampling method used.</li> <li>L Less than 3 bore volumes purged prior to sampling.</li> <li>U Parameter analyzed for but was not detected.</li> <li>G Possible grout contamination, pH &gt; 9.</li> <li>Q Qualitative result due to sampling technique</li> <li>X Location is undefined.</li> <li>J Estimated value.</li> <li>R Unusable result.</li> </ul>									
QA QUALIFIER: # = validated according to Quality Assurance guidelines.									

BLANKS REPORT (USEE810) FOR SITE MOA01, Moab Site  
 REPORT DATE: 2/22/2005 2:29 pm

PARAMETER	UNITS	LOCATION ID	SAMPLE DATE	ID	SAMPLE TYPE	RESULT	QUALIFIERS: LAB DATA QA			DETECTIO N	UN- CERTAINTY
Ammonia Total as N	mg/L	0999	11/19/2004	0001	E	0.1	U		#	0.1	-
Chloride	mg/L	0999	11/19/2004	0001	E	0.2	U		#	0.2	-
Sulfate	mg/L	0999	11/19/2004	0001	E	0.99			#	0.5	-
Total Dissolved Solids	mg/L	0999	11/19/2004	0001	E	20	U		#	20	-
Uranium	mg/L	0999	11/19/2004	0001	E	0.00003	B	U	#	8.3E-06	-

BLANKS REPORT (USEE810) FOR SITE MOA01, Moab Site  
 REPORT DATE: 2/22/2005 2:29 pm

PARAMETER	UNITS	LOCATION ID	SAMPLE DATE	SAMPLE ID	SAMPLE TYPE	RESULT	QUALIFIERS: LAB DATA QA	DETECTIO N	UN- CERTAINTY
RECORDS: SELECTED FROM USEE810 WHERE site_code='MOA01' AND quality_assurance = TRUE AND (data_validation_qualifiers IS NULL OR data_validation_qualifiers NOT LIKE '%R%' AND data_validation_qualifiers NOT LIKE '%X%') AND DATE_SAMPLED between #11/18/2004# and #11/19/2004#									
SAMPLE ID CODES: 000X = Filtered sample (0.45 µm). N00X = Unfiltered sample. X = replicate number.									
SAMPLE TYPES: E EQUIPMENT BLANK									
LAB QUALIFIERS:									
* Replicate analysis not within control limits.									
+ Correlation coefficient for MSA < 0.995.									
> Result above upper detection limit.									
A TIC is a suspected aldol-condensation product.									
B Inorganic: Result is between the IDL and CRDL. Organic: Analyte also found in method blank.									
C Pesticide result confirmed by GC-MS.									
D Analyte determined in diluted sample.									
E Inorganic: Estimate value because of interference, see case narrative. Organic: Analyte exceeded calibration range of the GC-MS.									
H Holding time expired, value suspect.									
I Increased detection limit due to required dilution.									
J Estimated									
M GFAA duplicate injection precision not met.									
N Inorganic or radiochemical: Spike sample recovery not within control limits. Organic: Tentatively identified compound (TIC).									
P > 25% difference in detected pesticide or Arochlor concentrations between 2 columns.									
S Result determined by method of standard addition (MSA).									
U Analytical result below detection limit.									
W Post-digestion spike outside control limits while sample absorbance < 50% of analytical spike absorbance.									
X Laboratory defined (USEPA CLP organic) qualifier, see case narrative.									
Y Laboratory defined (USEPA CLP organic) qualifier, see case narrative.									
Z Laboratory defined (USEPA CLP organic) qualifier, see case narrative.									
DATA QUALIFIERS:									
F Low flow sampling method used.									
G Possible grout contamination, pH > 9.									
J Estimated value.									
L Less than 3 bore volumes purged prior to sampling.									
Q Qualitative result due to sampling technique									
R Unusable result.									
U Parameter analyzed for but was not detected.									
X Location is undefined.									
QA QUALIFIER: # = validated according to Quality Assurance guidelines.									

# **Water Level Data**

STATIC WATER LEVELS (USEE700) FOR SITE MOA01, Moab Site  
 REPORT DATE: 2/22/2005 2:29 pm

LOCATION CODE	FLOW CODE	TOP OF CASING ELEVATION (FT)	MEASUREMENT		DEPTH FROM TOP OF CASING (FT)	WATER ELEVATION (FT)	WATER LEVEL FLAG
			DATE	TIME			
0403	O	3968.95	11/19/2004	11:12	16.29	3952.66	
0407	O	3969.09	11/18/2004	17:19	17.53	3951.56	
0470		3968.49	11/18/2004	11:51	19.28	3949.21	
0471		3968.83	11/18/2004	12:05	19.69	3949.14	
0472		3968.81	11/18/2004	12:15	19.37	3949.44	
0473		3969.05	11/18/2004	12:32	20.45	3948.60	
0474		3969.22	11/18/2004	12:44	18.26	3950.96	
0475		3969.46	11/18/2004	12:53	19.46	3950.00	
0476		3969.48	11/18/2004	13:04	20.74	3948.74	
0477		3969.40	11/18/2004	13:19	18.25	3951.15	
0478		3969.49	11/18/2004	13:33	19.54	3949.95	
0479		3969.27	11/18/2004	13:42	19.04	3950.23	
0483		3968.90	11/19/2004	09:00	17.42	3951.48	
0484		3969.19	11/19/2004	09:27	17.04	3952.15	
0557		3968.85	11/19/2004	08:11	15.84	3953.01	
0559		3969.92	11/19/2004	10:03	17.91	3952.01	
0560		3968.77	11/19/2004	10:32	16.63	3952.14	
0562		3956.29	11/18/2004	11:00	3.86	3952.43	
0563		3955.05	11/18/2004	11:05	2.79	3952.26	
0564		3956.39	11/18/2004	11:15	3.88	3952.51	
0565		3954.05	11/18/2004	11:20	1.48	3952.57	
0580		3969.32	11/19/2004	11:40	16.90	3952.42	

RECORDS: SELECTED FROM USEE700 WHERE site\_code='MOA01' AND LOG\_DATE between #11/18/2004# and #11/19/2004#

FLOW CODES: O ON-SITE

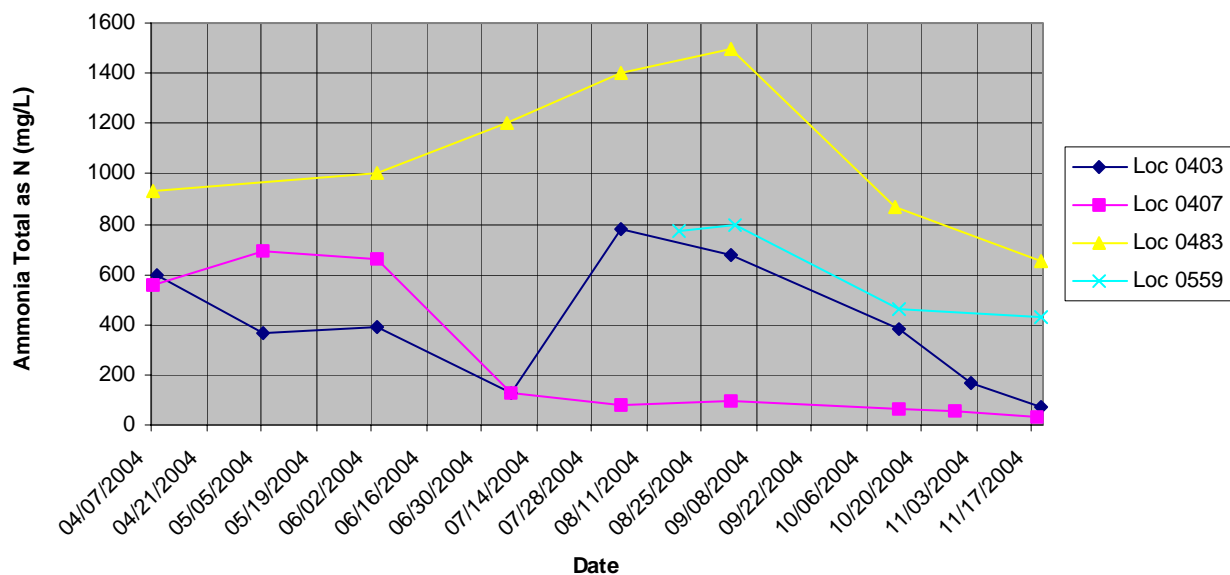
WATER LEVEL FLAGS:



## **Time Versus Concentration Graphs**

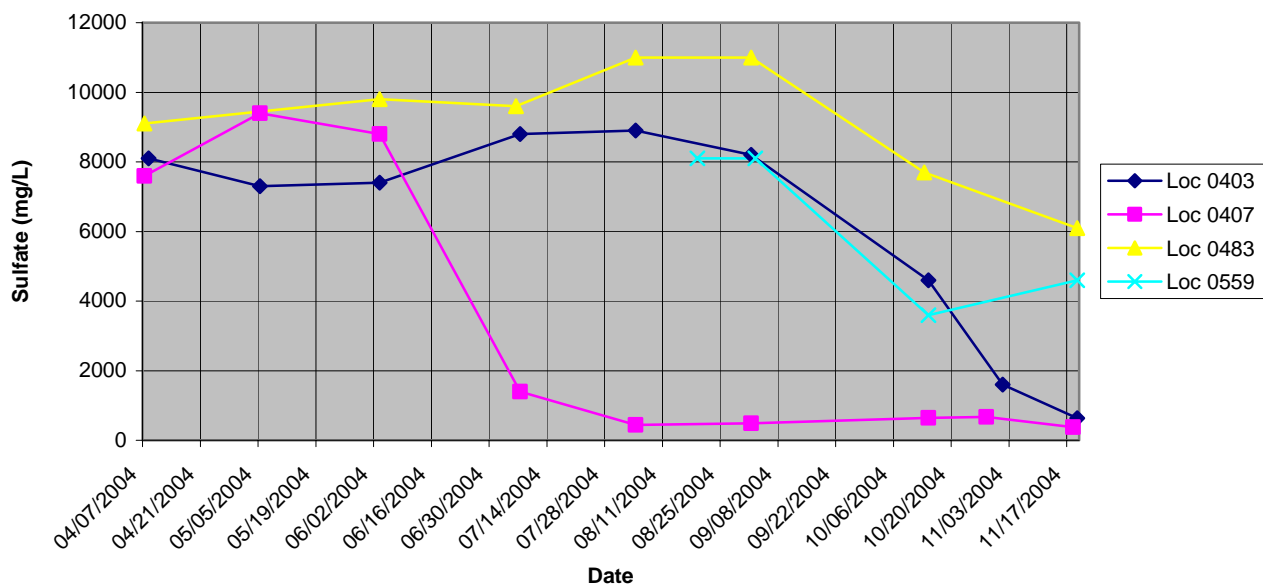
Moab Site (MOA01)

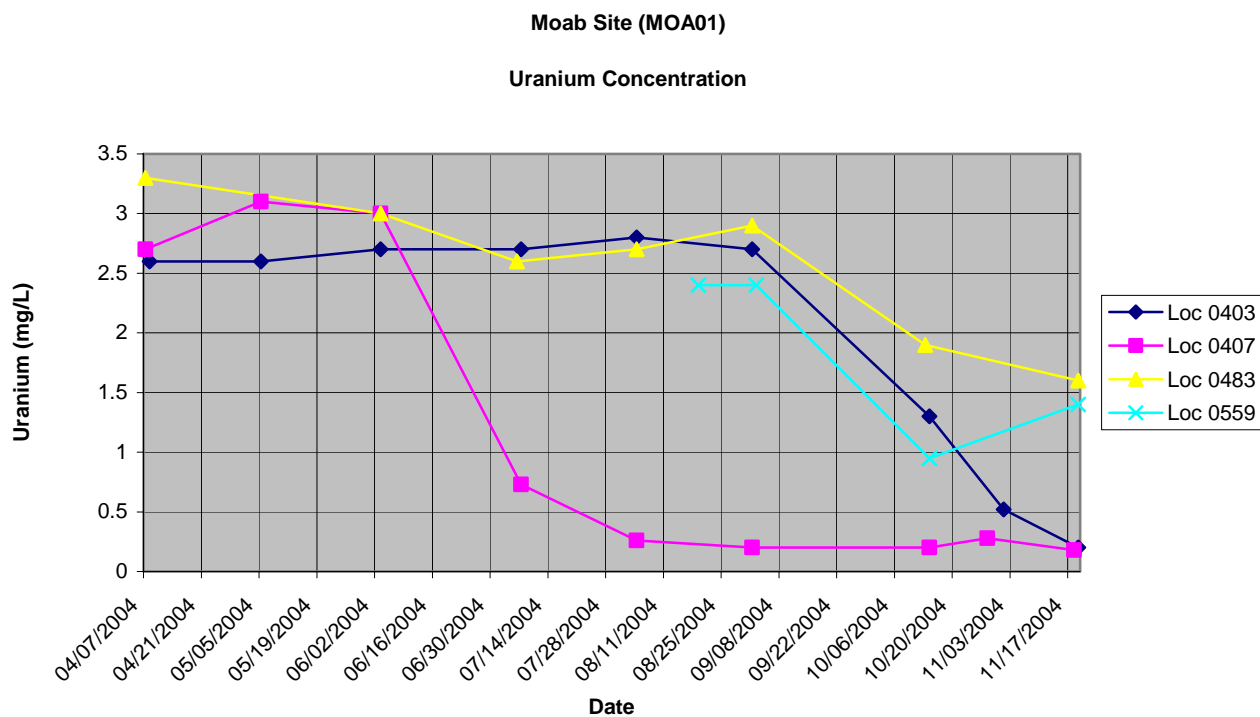
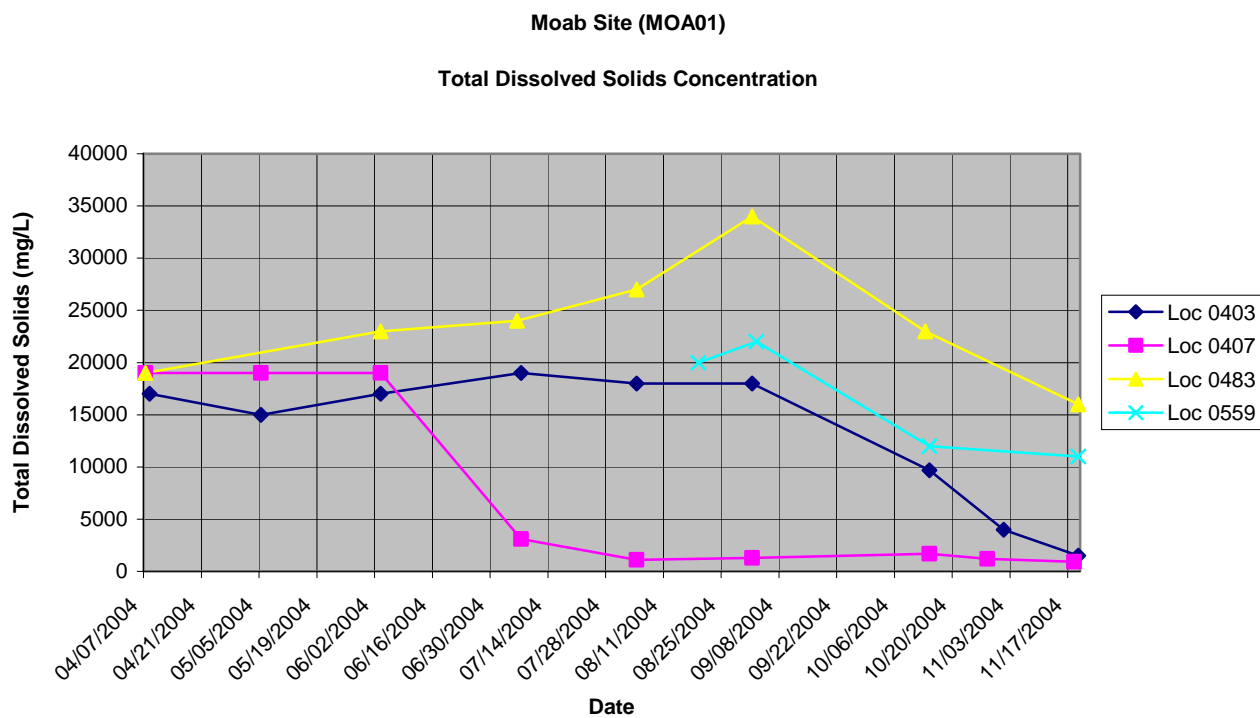
Ammonia Total as N Concentration



Moab Site (MOA01)

Sulfate Concentration





**Attachment 2**  
**Trip Report**



*established 1959*

DATE: December 6, 2004

TO: Ken Karp

FROM: K. G. Pill

SUBJECT: Trip Report

**Site:** Moab – Interim Action Configuration I Extraction Well Field Monthly Sampling – November 2004

**Date of Sampling Event:** November 18 and 19, 2004.

**Team Members:** Ken Pill and Steve Hall.

**Number of Locations Sampled:** 10 extraction wells (0470 through 0479), 7 observation wells (0403, 0407, 0483, 0484, 0557, 0559, and 0560), 3 piezometers (0563, 0564, and 0565) and 4 surface water locations (0216, 0236, 0547, and 0548). Including one duplicate and one equipment blank, a total of **26** samples were collected.

**Locations Not Sampled/Reason:** Piezometer 0562 never recharged after the initial purge, and we were not able to collect a sample from this location.

**Field Variance:** Only a 125 ml sample was collected for uranium analysis as opposed to the standard 500 ml sample volume.

**Quality Control Sample Cross Reference:** Following are the false identifications assigned to the quality control samples:

FALSE ID	TRUE ID	SAMPLE TYPE	ASSOCIATED MATRIX	TICKET NUMBER
2689	0236	Duplicate	Surface water	NDY-562
2690	NA	Equipment Blank	Water	NDY-567

**RIN Number Assigned:** All samples were assigned to RIN **04110136**.

**Sample Shipment:** All samples were shipped (in one cooler) overnight FEDEX to Paragon Analytics, Inc. from Moab, Utah, on November 19, 2004 (Airbill No. 809324804046).

**Location Specific Information – Extraction Wells:** Each extraction well was sampled using dedicated submersible pumps. Extraction well water levels and pumping rates (gpm) for each extraction well prior to sampling occurred are provided in the table below:

Well No.	Date	Time	Water Level (ft btoc)	Pumping Rate (gpm)
0470	11/18/04	11:52	19.28	4.14
0471	11/18/04	11:52	19.69	3.45
0472	11/18/04	11:52	19.37	2.86
0473	11/18/04	11:53	20.45	3.32
0474	11/18/04	11:53	18.26	1.85
0475	11/18/04	11:53	19.46	2.22
0476	11/18/04	11:54	20.74	1.87
0477	11/18/04	11:54	18.25	1.15
0478	11/18/04	11:54	19.54	2.10
0479	11/18/04	11:55	19.04	2.04

**Location Specific Information – Observation Wells:** All observation wells were sampled using micro-purge techniques with a peristaltic pump and downhole tubing. Sample depths and water levels for each observation well are listed below. **Note the sample depths are below ground surface.**

Well No.	Date	Time	Depth to Water (ft btoc)	Sample Depth (bgs)
0403	11/19/04	11:12	16.29	18
0407	11/18/04	17:19	17.53	17
0483	11/19/04	9:00	17.42	18
0484	11/19/04	9:27	17.04	28
0557	11/19/04	8:11	15.84	40
0559	11/19/04	10:03	17.91	20
0560	11/19/04	10:32	16.63	31

The field parameters were also measured in Configuration II observation well 0580, located approximately 20 ft northwest of Configuration I observation well 0403. The table below provides the data collected:

Location	Date	Time	Temp (°C)	Specific Conductance (μS/cm)	pH	ORP
0580	11/19/04	11:44	15.36	3925	7.34	36

**Location Specific Information – Piezometers:** Water levels were measured in piezometers 562, 0563, 0564, and 0565. It was dry at the base at each location (photographs of each location are attached to this report). The data is provided below:

PZ No.	Date	Time	Depth to Water (ft btoc)	Total Depth (ft btoc)	Stick Up (ft ags)
0562	11/18/04	11:08	3.86	4.89	3.47
0563	11/18/04	11:15	2.79	5.19	1.64
0564	11/18/04	11:20	3.88	4.81	3.52
0565	11/18/04	11:25	1.48	5.02	1.12

Limited sample volumes were collected from 0563, 0564, and 0565 (130, 10, and 150 mls, respectively). Piezometer 0562 never recharged after the initial purging, and was not sampled. The purge water field parameter data is presented below for 0562:

Location	Date	Time	Temp (°C)	Specific Conductance (µS/cm)	pH	ORP	Turbidity (NTUs)
0562	11/18/04	11:08	14.42	1760	7.62	187	139

Field parameters were measured in the surface water adjacent to the piezometer locations. This information is provided below:

Measurement Location	Surface Water Parameters						
	Date	Time	Temp (°C)	Specific Conductance (µS/cm)	pH	ORP	Turbidity (NTUs)
0244	11/18/04	11:02	10.72	1836	7.89	193	104
0245	11/18/04	11:06	9.72	1198	8.12	155	70.5

**Location Specific Information – Surface Water Sampling:** Location 0216 was sampled 10 ft to the north of the previous sampling events in order to find a location deep enough to conduct sampling and sample water in contact with the base of the bank. A photo of this location and 0236 is attached to this report.

The water level of the evaporation pond (according to the staff gauge) at the time 0547 and 0548 was sampled was 5.6 ft

**Well Inspection Summary:** A well inspection was not conducted.

**Equipment:** All equipment functioned properly.

**Site Issues:** The extraction wells had been running since June 2004.

According to the USGS Cisco Gaging Station (Station No. 09180500), the mean daily Colorado River Flow on November 18, 2004, was 3,390 cfs. The flow decreased to 3,280 cfs on November 19, 2004.

**Corrective Action Required/Taken:** None.

(KGP/lcg)

cc: J. D. Berwick, DOE-EM (e)  
D. R. Metzler, DOE-EM  
C. I. Bahrke, Stoller (e)  
L. E. Cummins, Stoller (e)  
S. E. Donovan, Stoller (e)  
K. E. Miller, Stoller  
K. G. Pill, Stoller (e)  
L. M. Wright, Stoller (e)  
Working File, MOA



Sampling Piezometers 0562 and 0563



Sampling Piezometers 0564 and 0565





Sampling SW Location 0216



Sampling SW Location 0236